APPENDIX A
(clean version of amended claims)

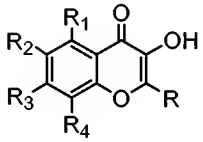
1. **(Previously Presented)** A method comprising:

photochemically generating an oxidopyrylium species from a 3-hydroxychromone derivative; and

performing a cycloaddition reaction between the oxidopyrylium species and a dipolarophile to form a cycloadduct.

2. **(Previously Presented)** The method of claim 1, wherein the oxidopyrylium species is generated via a process comprising an excited state intramolecular proton transfer.

3. **(Previously Presented)** The method of claim 1, wherein the oxidopyrylium species is photochemically generated from a 3-hydroxychromone derivative with the following chemical structure:

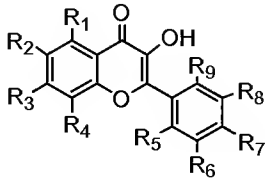


(I)

wherein R_1, R_2, R_3, R_4 and R are identical or different and selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

4. **(Previously Presented)** The method of claim 1, wherein the oxidopyrylium species is photochemically generated from a 3-hydroxychromone derivative with the following chemical structure:

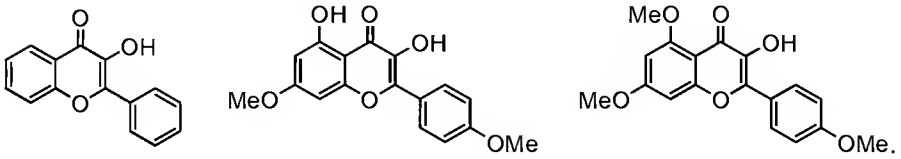


(II)

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 are identical or different and selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

5. **(Previously Presented)** The method of claim 4, wherein the 3-hydroxychromone derivative has one of the following chemical structures:



6-7. **(Cancelled)**

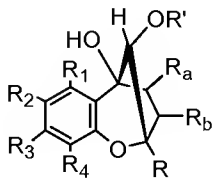
8. **(Previously Presented)** The method of claim 1, wherein the cycloaddition reaction comprises a 1,3-dipolar cycloaddition reaction.

9. **(Previously Presented)** The method of claim 1, further comprising converting the

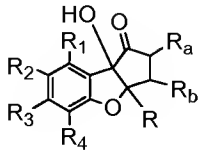
cycloadduct.

10-18. **(Cancelled)**

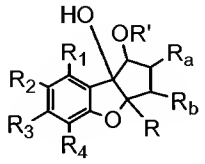
19. **(Currently Amended)** The method of claim 9, wherein the cycloadduct is converted into a compound selected from the group consisting of:



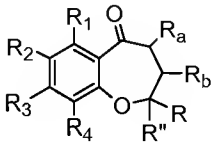
(VI)



(VII)

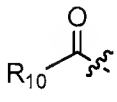


(VIII)



(IX)

wherein:

R_a is  and R_b is  ;

R_{10} is selected from the group consisting of hydrogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, and a protecting group;

R' is selected from the group consisting of hydrogen, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-S(O)R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, and $-N(R_x)S(O)_2R_x$; and

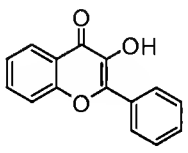
R_1, R_2, R_3, R_4, R, R", R_{11}, R_{12}, R_{13}, R_{14}, and R_{15} are identical or different and selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino

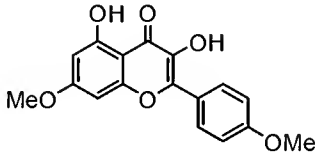
aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$;

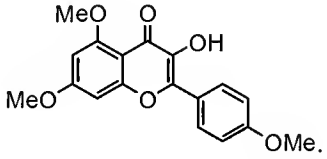
wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

20-21. **(Cancelled)**

22. **(Currently Amended)** The method of claim 23, wherein the 3-hydroxychromone derivative has one of the following chemical structures:

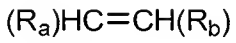






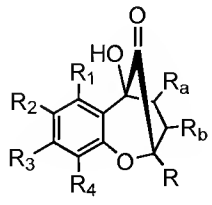
23. **(Currently Amended)** The method of claim 3 or 4, wherein:

the dipolarophile is of formula (**IV**):

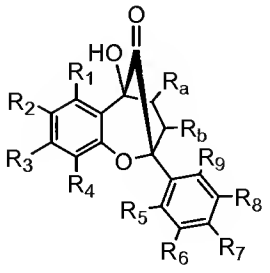


(**IV**);

and the cycloadduct is of formula (**V**) or (**V'**):

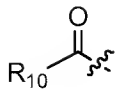


(**V**)



(**V'**)

wherein:

R_a is  and R_b is  ;

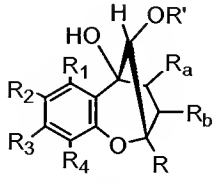
R_{10} is selected from the group consisting of hydrogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, and a protecting group; and

R_{11}, R_{12}, R_{13}, R_{14}, and R_{15} are identical or different and selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

24-29. **(Cancelled)**

30. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V**) into a compound of formula (**VI**):



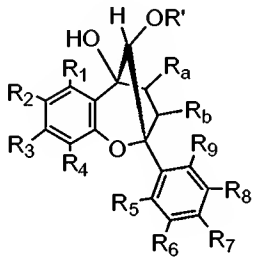
(**VI**).

wherein R' is selected from the group consisting of hydrogen, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic,

aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-S(O)R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, and $-N(R_x)S(O)_2R_x$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

31. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V'**) into a compound of formula (**VI'**):

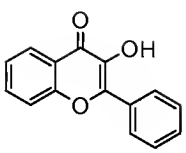
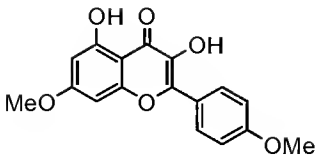
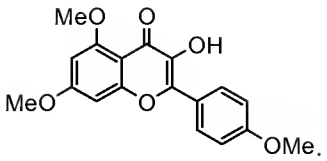


(**VI'**).

wherein R' is selected from the group consisting of hydrogen, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-S(O)R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$,and $-N(R_x)S(O)_2R_x$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

32. **(Previously Presented)** The method of claim 31, wherein the 3-hydroxychromone derivative has one of the following chemical structures:

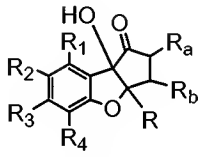
33. **(Cancelled)**

34. **(Previously Presented)** The method of claim 30 or 31, wherein converting the compound of formula (**V**) or (**V'**) into a compound of (**VI**) or (**VI'**) comprises a reduction.

35. **(Currently amended)** The method of claim 34, wherein the reduction comprises using $NaBH_4$ or $Me_4NBH(OAc)_3$.

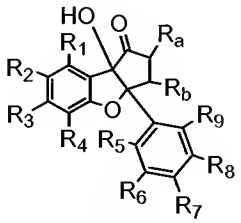
36. **(Previously Presented)** The method of claim 30 or 31, wherein converting the compound of formula (**V**) or (**V'**) into a compound of (**VI**) or (**VI'**) comprises addition of a nucleophile.

37. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V**) into a compound of formula (**VII**):



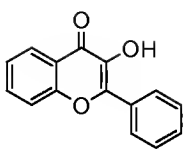
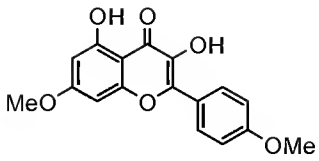
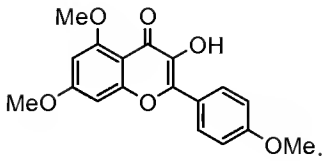
(**VII**).

38. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V'**) into a compound of formula (**VII'**):



(**VII'**).

39. **(Previously Presented)** The method of claim 38, wherein the 3-hydroxychromone derivative has one of the following chemical structures:

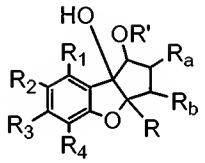




40. **(Cancelled)**

41. **(Previously Presented)** The method of claim 37 or 38, wherein converting the compound of formula (**V**) or (**V'**) into a compound of formula (**VII**) or (**VII'**) comprises an α-ketol (acyloin) rearrangement and, optionally, a hydroxyl-directed reduction.

42. **(Original)** The method of claim 41, wherein the α-ketol (acyloin) rearrangement comprises a base-mediated reaction.

43. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V**) into a compound of formula (**VIII**):

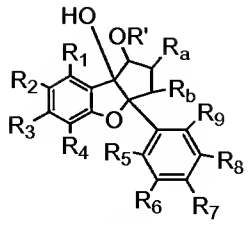


(VIII)

wherein R' is selected from the group consisting of hydrogen, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-S(O)R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, and $-N(R_x)S(O)_2R_x$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

44. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V'**) into a compound of formula (**VIII'**):

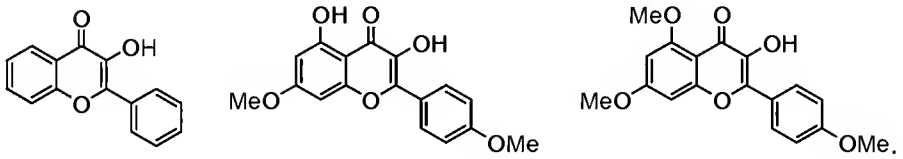


(VIII')

wherein R' is selected from the group consisting of hydrogen, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-S(O)R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, and $-N(R_x)S(O)_2R_x$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

45. **(Previously Presented)** The method of claim 44, wherein the 3-hydroxychromone derivative has one of the following chemical structures:



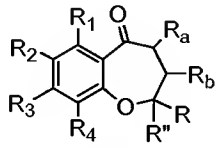
46. **(Cancelled)**

47. **(Previously Presented)** The method of claim 43 or 44, wherein converting the compound of formula **(V)** or **(V')** into a compound of formula **(VIII)** or **(VIII')** comprises an α-ketol (acyloin) rearrangement and, optionally, a hydroxyl-directed reduction.

48. **(Original)** The method of claim 47, wherein the α-ketol (acyloin) rearrangement comprises a base-mediated reaction.

49. **(Currently Amended)** The method of claim 23, further comprising converting the

compound of formula (**V**) into a compound of formula (**IX**):

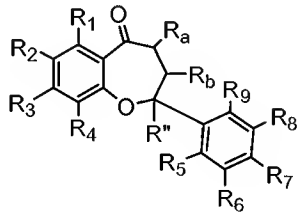


(IX)

wherein R" is selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$, $-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

50. **(Currently Amended)** The method of claim 23, further comprising converting the compound of formula (**V'**) into a compound of formula (**IX'**):



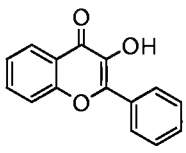
(IX')

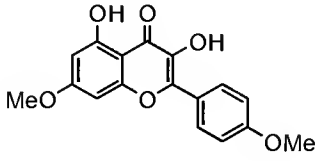
wherein R" is selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy, aryloxy, heteroalkoxy, heteroaryloxy, thioalkyl, thioaryl, acyl, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, heteroaryl, alkylamino, amino alkyl, arylamino, amino aryl, a protecting group, $-NO_2$, -CN, $-CF_3$, $-CH_2CF_3$, $-CHCl_2$, $-CH_2OH$, $-CH_2CH_2OH$, $-CH_2SO_2CH_3$, $-C(=O)R_x$, $-CO_2(R_x)$, $-C(=O)N(R_x)_2$, $-OC(=O)N(R_x)_2$, $-OC(=O)R_x$, $-OCO_2R_x$, $-S(O)R_x$, $-S(O)_2R_x$, $-NR_x(CO)R_x$, $-N(R_x)CO_2R_x$,

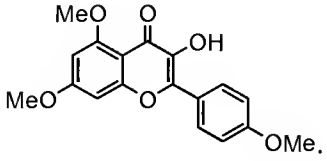
$-N(R_x)C(=O)N(R_x)_2$, $-N(R_x)S(O)_2R_x$, and $-S(O)_2N(R_x)_2$,

wherein each occurrence of R_x is independently selected from the group consisting of hydrogen, aliphatic, alicyclic, heteroaliphatic, heterocyclic, aromatic, heteroaromatic, aryl, and heteroaryl.

51. **(Previously Presented)** The method of claim 50, wherein the 3-hydroxychromone derivative has one of the following chemical structures:







52. **(Cancelled)**

53. **(Previously Presented)** The method of claim 49 or 50, wherein converting the compound of formula (**V**) or (**V'**) into a compound of formula (**IX**) or (**IX'**) comprises an oxidative cleavage.

54. **(Original)** The method of claim 53, wherein the oxidative cleavage comprises using $Pb(OAc)_4$.

55-81. **(Cancelled)**